



Exploring Possible Futures

Video Transcript

What are economic models?

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To answer this question, let us ask first: what is a model.

This is a model, an architectural model. A model is a simplified depiction of a part of the real world. Such a depiction is always useful if we want to test a new idea, but not in the real world. The military uses models to test new strategies in the absence of a real war. A car manufacturer uses models to test the stability of cars in a controlled test setting. Economists use models to test the consequences of new policies or market designs that have not yet been implemented.

All these approaches have one thing in common: a model is used to answer specific questions in cases where we cannot infer the answer directly from reality. This gives us a first, and one of the most important insights about models. Models do not have to be perfect pictures of the real world. They only need to have the features that are necessary to answer the questions at hand. If we want to test whether a ship capsizes or swims, we do not need a model with painted sails and details of the hull. Rather, we need to make sure that we use the correct materials and get the proportions right.

This holds for all type of models. A model does not need to be detailed or beautiful. It does not need to be a complete description of the relevant part of the real world. It only needs to be fit for purpose, but is fit to answer the questions at hand. Often, too much detail is even harmful. If we invest too much into capturing tiny details, we tend to lose sight of the main structure of our model, which is usually much, much more important than the details. In economics, we use models that are not physical structures like our ship here. Rather, our models consist of equations. Such equations describe how part of our reality works in a simplified and yet consistent way.

We use these models to show how climate policy induces technological change, or what economic consequences a transition to a renewable energy system might have. When we build economic models to tackle such problems, we have to make sure that they are fit for purpose. There has been a long philosophical discussion as to what economic models are and what distinguishes a good from a bad model.

Varian holds that economic models are a story with a structure. The equations form a structure which ensures that arguments are consistent. The economist embeds this structure into a story by telling what the equations depict and by interpreting the results. He argues that we believe that the results of a model can be transferred to reality because we find that the assumptions of the model are sufficiently close to real world conditions. In his view, models should not be seen as refuted because the assumptions are not perfectly in line with reality.

Furthermore, models are often used in a casual way where the assumptions are not tested with statistical methods, but where we rather use examples to argue that our assumptions are close enough to reality.



Sugden argues that while we economists use deduction to derive results from our assumptions in our model worlds, we use what he calls inductive inference to transfer our insights to the real world. We use particular examples from the real world to highlight how the conclusions of our model are correct. Then we argue that the mechanism described in the model is actually at work in those examples and possibly also in other cases. For example, in one of my papers, I've shown that different climate policies lead to different directions of technological progress because they induce different types of risks to the regulated firms.

Using a real world example, I argue that this conclusion can be observed in reality and that a risk-based mechanism behind it should be seen as plausible. Naturally, this kind of reasoning is not watertight. Sugden thus argues that we do not only have to make sure that our models are consistent, we also need to show that our models are credible and that the results are robust to small variations in our assumptions.

Taking these points together, a model does not need to describe all aspects of reality. Rather, it has to be fit for purpose. It has to be internally consistent and credible. And its results have to be robust. In the following step, I would ask you to go into the discussion, what is an economic model, in somewhat more detail.